

Work Order ID 138122

Monday, October 26, 2015 7:19:51 AM

138122

PRELIMINARY ISSUE

Page 1

Item ID: D5338-1

Accept

N900040100

Setup Start

NS1

Revision ID: PRELIM

Item Name: Bushing

Stop *NS2*

Start Date: 10/26/2015 Start Qty: 16.00

16

Cust Item ID:

Required Date: 10/26/2015 Req'd Qty: 16.00

16

Customer:

Reference:

Approvals:

Process Plan: MLJ

Date: 10/27/15

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D5338

A3

AA

Rev A 5-7/12/15

100

0.00

100

Hardinge CNC LATHE SMALL

Hardinge

Memo

0.00

16 φ Jfc 2015-10-28

Hardinge CNC Lathe Small

Turn per Folio FB429 and Dwg D5338 Deburr BOTH ENDS

FOLIO REV: AA

DWG REV: A3

110

QC2- Inspect parts off machine FAI/FAIB

0.00

110

QC

Memo

0.00

16 φ Jfc 2015-10-28

Quality Control

120

QC8- Inspect parts - second check

0.00

120

QC

Memo

0.00

(16) φ DAS 38 9-89 OCT 29 2015

Quality Control

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause			FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐	
OTHER : ☐						

PRELIMINARY ISSUE

Work Order ID 138122

Monday, October 26, 2015 7:19:51 AM

138122

Page 2

Item ID: D5338-1 Accept *N900040100* Setup Start *NS1*

Revision ID: PRELIM Stop *NS2*

Item Name: Bushing

Start Date: 10/26/2015 Start Qty: 16.00 *16*

Required Date: 10/26/2015 Req'd Qty: 16.00 *16*

Reference: Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: <u>PRELIM</u>	0.00							DAS 38 9-89
130									
Packaging	Memo	0.00							
Packaging	*****STOCK IN BASKET CELL***** LOCATION : WA004								OCT 29 2015
140	QC21- Final Inspection - Work Order Release	0.00							
140									
QC	Memo	0.00							
Quality Control									

MLS NOV 12 2015

POSITIVE RECALL
EFFECTIVE OCT 29 2015 AUTH MLS
RELEASED 8 DATE 7/21/15

R015-1016-01

Rev A Drawing attached
8-7-15/15

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed:

Date:

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐		Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐					
OTHER : ☐									

Picklist Print

Monday, October 26, 2015 7:19:55 AM

PRELIMINARY ISSUE

Page 1

Work Order ID: 138122

138122

Parent Item: D5338-1

D5338-1

Parent Item Name: Bushing

Start Date: 10/26/2015

Required Date: 10/26/2015

Start Qty: 16.00

Required Qty: 16.00

Comments: IPP REV:A NEW ISSUE 15-10-13 JLM VERIFIED BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M304R.500		Purchased	No				f	43.3550		0.690526			

M304R 500******

304 SS roundbar .500

LocationLoc QtyLoc Code

MAT029

43.355

m126151

19.355

m131999

24

1.0 ft Jfc 2015-10-28

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

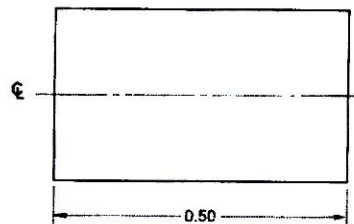
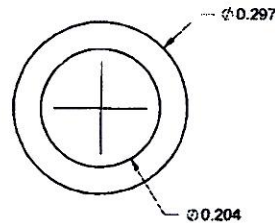
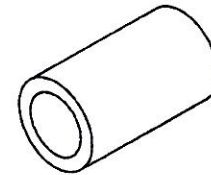
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date : _____		Step #: _____		QTY Effective : _____			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐		
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐		
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐		
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐		
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐		
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐		
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐		
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐		
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐		
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐		
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____					
Misidentified ☐	Past Due ☐						

PRELIMINARY ISSUE



D5338-1 BUSHING

STOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO 138.122 MLJ
15-10-26

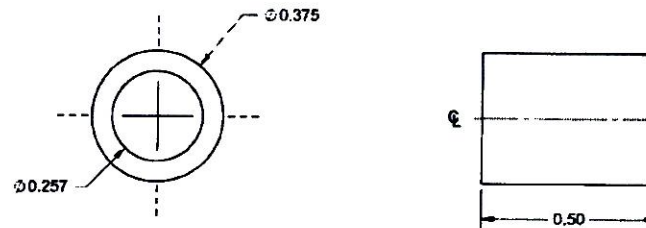
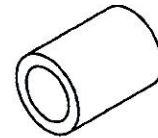
NOTES:

- 1) MATERIAL: AISI 304/316, STAINLESS STEEL ROUND BAR
PER ASTM 276
(REF. DART SPEC M304R)
OR AISI 304/316, STAINLESS STEEL ROUND TUBING
REF ASTM A213 OR ASME SA213 OR ASTM A269
(REF. DART SPEC M304TR)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.01 lbs

PRELIMINARY ISSUE

A		NEW ISSUE		RF	15.08.10
REV.	DESCRIPTION			BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA			
DRAWN	RF				
CHECKED	AK	DRAWING NO.		REV. A3	
MFG. APPR.	DD	D5338		SHEET 1 OF 2	
APPROVED		TITLE		SCALE	
DE APPR.		BUSHING		NTS	
DATE	15.08.10	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

PRELIMINARY ISSUE



D5338-3 BUSHING

NOTES:

- 1) MATERIAL: AISI 304/316, STAINLESS STEEL ROUND BAR
PER ASTM 278
(REF. DART SPEC M304R)
OR AISI 304/316, STAINLESS STEEL ROUND TUBING
REF ASTM A213 OR ASME SA213 OR ASTM A289
(REF. DART SPEC M304TR)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.008 lbs

PRELIMINARY ISSUE

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AK	DRAWING NO.	REV. A3
MFG. APPR.	DD	D5338	SHEET 2 OF 2
APPROVED		TITLE	SCALE
DE APPR.		BUSHING	NTS
DATE	15.08.10	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS UNCLASSIFIED AND CONFIDENTIAL. IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Thursday, June 27, 2013 1:01:21 PM

All amounts are calculated in domestic currency.

All Vendors. PO ID PO20231 Receipt Dates from 6/27/2013 to 6/27/2013 All Line Item Types

All Item ID/GL/WOs All Rec. Employees All Currencies

Grouped by Vendor ID

[illegible]

**Castle Metals®**

A. M. Castle & Co.

PACKING SLIP/
CERTIFICATE OF CONFORMANCE

Page 1 of 1

Shipment No:1796462

Ship From: A. M. Castle & Co. MONTREAL - CASTLE METALS 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CAN		Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
Date Shipped 25-JUN-2013	F.O.B. ORIGIN	Freight Terms Prepaid		Carrier MANITOULIN		BOL No 1796462-2	

Shipment Details	Final Destination Branch - MON
-------------------------	---------------------------------------

Order No 2914169	Line No 1	Item No 15044	Description 0.5000.RD.304/304L.STAINLESS.CF.ANN.132.0000-156.0000 SPECIFICATIONS: ASTM A276				
Purchase Order No 20231		Part Number		Ordered Qty 48.00 FT		Invoice Qty 48.0000 FT	
Details		END USER: DART AEROSPACE END USE: COMMERCIAL AIRCRAFT PARTS ECCN # EAR99					
Delivery No. 118840019	Mill NORTH AMERICAN STAINLESS	Heat Number H2H2	Mech Id	PCS 4	Width (IN)	Length (IN) 144.0000	Shipped Qty(LBS) 32.0640

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:

Name:



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO20231

Purchase Order Date 6/19/2013

PO Print Date 6/19/2013

Page Number 1 of 2

Order From : VC-MET001
METAUX CASTLE
A.M. CASTLE & CO. (CANADA) INC. - C/O 910720
P.O. BOX 4090 STN A
TORONTO, ON M5W OE9
CA

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 514 694 9575

Ship To Contact
Ship To Phone
Ship Via: Yours ppd
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB Destination-Collect

FAKED
6/30/13

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	List Price	Disc %	Discounted Unit Price	Extended Price
1	M304B0.250x0.500 MATERIAL: AISI 304/316 SS BAR OR AISI 304/316 SS PLATE (NOTE: AISI 303 NOT ACCEPTABLE)	304 BAR .250 x .500	6/28/2013 Yes 6/28/2013		500.00 f 509.0833				\$1,215.00
Line Total:									\$1,215.00
2	M304R.500 MATERIAL: AISI 304/316 SS ROUND BAR AS PER ASTM A276 (NOTE: AISI 303 NOT ACCEPTABLE)	304 SS roundbar .500	6/28/2013 Yes 6/28/2013		48.00 f ✓				\$70.56
Line Total:									\$70.56
3	M304R1.000 AS ABOVE	304 round bar 1.00	6/28/2013 Yes 6/28/2013		24.00 f ✓ 13/1/27				\$144.72

Note:

6/19/2013



METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(502) 347-6000

Certificate: 833559 14 Mail To:
A.M. CASTLE AND COMPANY
1420 KENSINGTON ROAD-SUITE 220
OAK BROOK IL 60523

Ship To:
A.M. CASTLE AND COMPANY
3400 NORTH WOLF ROAD
FRANKLIN PARK IL 60131

Date: 5/07/2013 Page: 1 OF 1
Steel: 304/304L
Finish: Cold Draw
Dia/Thk: .5000 in
Leg Length:
Length: 144.00 in
Corrosion: ASTM A262-10 Prac A/E OK

Customer: 0032 001
NAS Order: LN 97566 1
Your Order: 217596

Item Code: 15044

PRODUCT DESCRIPTION:

ASTM A193/10a-ASME SA193/10 CL 1 GR B8
GRAIN SIZE= 4-6
Round Bar, Annealed, Cold Draw
UNS 30400/30403 EN 10204 3.1, ASTM A484/11
ASTM A276/10, ASTM A479/11, ASTM A182/10 CHEM ONLY,
ASME SA479/10a, ASME SA182/10 CHEM ONLY
AMS 5639H, AMS 5647J, AMS QQG-763B, QQG-763F, ASTM F899/11
SOLUTION ANNEAL TEMP 1900F MIN, ASTM A320/08 CL 1 GR B8

REMARKS:

COMPLIES W/REQUIREMENTS OF DFM 252.225-7014A-1 EU DIRECTIVE
2011/65/EU RoHS. HAF+AOD+CC. NO WELD REPAIR. MELTED AND MFG
IN USA FREE FROM MERCURY AND LOW MELTING ALLOY CONTAMINATION

Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight
BF38027	1809								

CHEMICAL ANALYSIS

CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan)

Chemical Analysis per ASTM A751/08

Heat	Supplier #	CM	C %	CO %	CR %	CU %	MN %	MO %	N %	NI %	P %	S %
H2H2		US	.025	.22	18.12	.36	1.30	.29	.054	8.62	.031	.0220
			SI %									
			.23									

Castle Metals EP

HEAT NUMBER

H2H2

MECHANICAL PROPERTIES

1 d	HB	.2YS	UTS	RA	Elong	
o i	No.	KSI	KSI	%	% 2"	
BF38027	R L	211.0	78.82	99.95	70.56	49.70

MECHANICAL ID

ITEM CODE

15044

LOT NUMBER

217596

PO NUMBER

5.8-13

RECEIPT DATE

NAS

SUPPLIER

SPECIFICATION

LCS

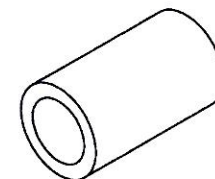
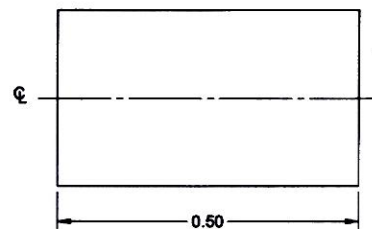
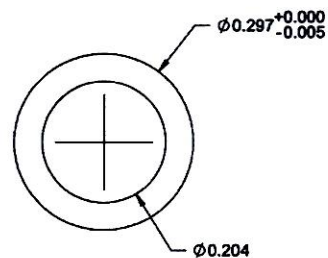
COMMENT

APPROVED

NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS

Technical
Dept. Mgr.

ERIC HESS



D5338-1 BUSHING

NOTES:

- 1) MATERIAL: AISI 303/304/316, STAINLESS STEEL ROUND BAR
PER ASTM A582 OR ASTM 276
(REF. DART SPEC M303R OR M304R)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.01 lbs

RELEASE
2016-01-21
SEN 1-104

APPROVED

A NEW ISSUE		RF	15.08.10
REV.	DESCRIPTION		BY DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	AK	DRAWING NO.	REV. A
MFG. APPR.	JLM	D5338	SHEET 1 OF 2
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	BUSHING	NTS
DATE	15.08.10	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS UNCLASSIFIED AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	